Independent Schools Attract Alumni

An educational institution dedicated to preparing graduates for leadership and service, Davidson College has long supported those students who wish to teach in public and private secondary schools upon graduation. Last year’s Review offered a glimpse into the hard work that three student teachers faced in their senior year while meeting the obligations both of the College and the State of North Carolina for public school teaching. In this issue we feature several mathematics graduates who are serving in education at private secondary schools. Perhaps surprisingly, in the last five years Davidson graduates began work in the field of education at a higher rate than the total alumni population—32% versus 21%—and of those teaching in secondary schools the year following graduation, mathematics graduates chose to teach in private schools at a higher proportion than their Davidson peers, roughly 50% versus 25%.

Why so? Some mathematics majors realize only during their senior year—or in the years following—that they feel a call to serve as a teacher of mathematics. The obstacles of obtaining certification, either by taking occasional courses at a local institution or by making the investment of time and energy to complete a full-time certification program, often lead these individuals to consider teaching in independent schools. At these schools, certification is usually not required, and new graduates are recruited nationally through placement firms.

Josh Roberts ’98 teaches three sections of Algebra I and two sections of Algebra II / Trigonometry at Robert Louis Stevenson School, a private, coeducational upper school in Pebble Beach, California. Josh’s position, like entry-level positions at many other boarding schools, includes living on campus, supervising a dorm, and coaching two athletic teams. “Having juggled several activities at once while at Davidson,” he notes, “was valuable experience.” Theatre classes at Davidson and camp counseling in the summers provided Josh with an additional leg up in his work. Despite the sometimes 80-hour weeks, however, Josh enjoys the chance to work with kids, especially on the field. “Hands down, my favorite part of the job is coaching baseball.”

Jalyn (Parsley) Wells ’95 began her teaching career after receiving certification at Davidson, and taught for three years in a public high school just outside of Dallas. Jalyn decided to try teaching at the Greenhill School, a private day school in Dallas, “to see what it was like,” and she finds great differences in the academic workload. At Greenhill she teaches four 45-minute classes chosen from Algebra I, Algebra II, and Geometry, and these classes are capped at 17 students, instead of five sections capped at 32 students. Now, she says, “I actually have a little free time for my husband and dog.”

She also finds her colleagues more enthusiastic about mathematics. On the other hand, she advises 10-12 students each week, is responsible for scheduling their classes and serving as their advocate when they get into trouble, and generally attends more meetings of various groups than she did in public school. Are there headaches at Greenhill? Sure, Jalyn says. “The copier breaks, teachers are using too much paper, students are still disrespectful to substitutes, students do not always do their homework. In the
end, students will still be teenagers with teenage problems.”

Both Jalyn and Josh value the opportunities for intellectual and other enrichment during the summer months. Jalyn’s colleagues grade Advanced Placement exams, attend conferences, and teach at summer programs in various places around the country. Others, like Jalyn herself, pursue graduate degrees. At Stevenson, Josh reports, several teachers have taken advantage of Middlebury College’s Breadloaf program for further study, while another is working on a master’s in theatre at Northwestern. Further off the beaten path, however, are a colleague who spent the summer on a clipper ship, and Josh himself, who plans to participate in a National Outdoor Leadership School backpacking and rock climbing trip. Last summer he spent six weeks in Europe. At some private schools, funds are available for summer study or more general enrichment experiences.

Tom Whipple ’89 has taught at two private schools in his ten years since graduating from Davidson, and his experiences shed light on the continuing challenges and rewards of independent school teaching. Tom’s first position was at The Kiski School, a boarding school for boys in Saltsburg, Pennsylvania, near Pittsburgh. Tom says that he enjoyed his time at Kiski, but tired quickly of the many extracurricular duties, coaching three sports a year and serving as a dormitory master for three years. Tom believes his experience to be typical: Without student teaching or public teaching experience, few college graduates will land jobs at an independent day school; instead, entrance into the profession often occurs through an apprentice-like position at an independent boarding school or, what he suspects would be better in the long run, a graduate program meant to prepare one for teaching secondary school.

After five years at Kiski, Tom sought positions at day schools. “I was looking for a school that was more similar to what I was used to when growing up in public school. I was also looking for more freedom, which can be a rare commodity at times in a boarding situation.” Tom found an institution meeting these requirements in the Sanford School in Hockessin, Delaware, near Wilmington. He now teaches mostly Geometry and Precalculus and is looking forward to a class of AB Calculus for the first time next year. He also occasionally coaches soccer, but is glad not to be required to do so.

Tom has not ruled out an eventual move to public school but does plan to remain at Sanford until local public schools reduce their class sizes. “I know of teachers here in Delaware who must teach five classes of 35 to 40 students. I have no idea how a teacher is supposed to keep his or her morale up when trying to teach this many. . . . Having taught for over ten years, I know that my morale is one of the most important pieces to my being a teacher.”

Davidson mathematics alumni in public and private schools serve as ambassadors for Davidson across the country. Josh’s enthusiasm for Davidson brought Rocky Charton ‘03 to Davidson, while Sam duPont ’03 credits Dominick Talvacchio ’98 for inspiration to attend Davidson from St. Andrew’s School in Delaware. Moreover, the many recent mathematics alumni teaching in public and private schools—-including Amy Biber ’98, Loralea Davidson ’99, Stephanie Eichenbrenner ’99, Jennifer Kazmarek ’99, Emily KatzFey ’99, Jay Rosenquest ’99, and Heather Weinberg ’96—-show that from Easley, South Carolina to Winnetka, Illinois to Pebble Beach, California, Davidson alumni are doing their part in one of the country’s most important service occupations.
Bernard Lectures

By Margaret Latterner ’00

Once a year at Davidson College, students and professors of mathematics as well as members of the college community gather for the Bernard Lecture honoring Dr. Richard Bernard, Davidson mathematics professor from 1955 until 1983. This year’s lecture, held on September 23, 1999, featured Dr. William R. Pulleyblank, Director of Mathematical Sciences Research Division and Director of the Deep Computing Institute at IBM.

The evening began at 6 p.m. as members of the Bernard Society arrived in Chambers Gallery for appetizers and drinks. Photographs of the group were taken followed by a formal dinner and induction ceremony presided over by department chair Stephen Davis and Bernard Society president Amy Smith ’00.

Dr. Pulleyblank was inducted as a new member of the society along with math majors in the class of 2001 as well as those majors in the class of 2000 who were absent from last year’s event. In addition, the Society welcomed and inducted Dr. Heather Hulett, a mathematician previously on the faculty of Miami University of Ohio, who joined our community after her marriage to Dr. Will this past summer. All told, some fifty people attended, including Dean Clark Ross, Harold Reiter of UNC-Charlotte, Boo ’39 and Margaret Walker, and recent alumni Beth DeWitt ’99, Greg Fisher ’94, Barbara Howard ’92, Uzra Khandker ’99, Rebecca Montague ’99, and Paul Shottes ’99.

The dinner concluded with dessert and coffee shortly before 8 p.m., and thirty students and members of the college community joined the banquet attendees for the lecture that followed. Dr. Pulleyblank began his talk, entitled “Duality and Mathematical Optimization,” with a look at systems of linear equations focusing on the question “When does a system of linear inequalities have a solution.” He challenged the audience to come up with solutions to several systems of inequalities.

Dr. Pulleyblank then discussed methods of finding optimal solutions to the traveling salesman problem: Let a salesman start at any city. How can he visit all of the cities and return to his starting point without going to any city twice? He also examined how to reduce the amount of time to draw a map using properties of perfect matchings, finding integral solutions to Diophantine equations, and integer programming. Throughout his talk, Dr. Pulleyblank presented processes by which one can find optimal solutions to various problems in minimal time.

He concluded his lecture with a question and answer session where a discussion of the Deep Blue Project developed. Dr. Pulleyblank discussed his role in the development of the computer chess
player. Deep Computing uses data to solve decision problems as they arise in both business and scientific domains.

Dr. Pulleyblank’s visit to Davidson College did not end Thursday night. He spent Friday morning with Dr. Davis’ abstract algebra class, ate lunch with students, and then spent the afternoon discussing career options in industry for math majors. His visit was a memorable experience and marked another successful Bernard Lecture.

The 2000 – 2001 Bernard Society Dinner will be held on October 19, 2000. The speaker will be Dr. Lenore Blum, a research scientist with broad interests in mathematics and computer science and a recent member of the International Computer Science Institute at UC-Berkeley. Former Vice-President of the American Mathematical Society and former President and co-founder of the Association for Women in Mathematics, she has been instrumental in encouraging undergraduate women in mathematics, most notably as the co-director of the acclaimed Mills College summer program for women. For additional information on Dr. Blum, visit the pages

http://www.cityu.edu.hk/ma/stuff/blum/blum.html

and

http://www.agnesscott.edu/lriddle/women/blum.htm

Watch for your invitation.
Laurie Heyer Joins Department

The Department of Mathematics is excited to announce that Laurie Heyer, an applied mathematician currently on a postdoctoral position at the University of Southern California, has accepted our offer to join the Department as an Assistant Professor in the fall of 2000.

Dr. Heyer’s research expertise lies in the area of “computational biology,” which she describes as the intersection of mathematics, computer science, and biology. After completing her doctoral degree in applied mathematics at the University of Colorado in 1998, she joined a research group at the Center for Computational and Experimental Genomics at USC. Experienced in modeling and statistics, she brings to the Department a fresh perspective on applied mathematics, as well as the prospect of increased interaction with the Department of Biology, and especially with Professor Malcolm Campbell, who works in genomics.

The Department anticipates that Dr. Heyer will begin to offer an upper-level course in applied mathematics or genomics, either through the Department or the Center for Interdisciplinary Studies. Also, she may support the minor in computer science, for from 1986 until 1994 she worked as an operations research analyst at Lockheed Martin Vought in Texas after receiving her bachelor’s degree from the University of Texas at Arlington. In addition, the general increase in the number of courses offered by faculty in the Department should allow us to lower our calculus enrollment ceilings as well as offer some different courses for freshmen and sophomores, from writing seminars to sections of the Humanities Program.

This new faculty position in mathematics is due to the generosity of the Kimbrough family, which endowed the John T. Kimbrough ’26 professorship in mathematics, honoring the Davidson professor of mathematics from 1928 to 1974. In order to continue providing a curriculum of the highest quality, the Department had identified several goals, including reducing the size of introductory calculus classes, adding variety to offerings in upper-level mathematics and computer science, and providing coverage for faculty to offer new courses satisfying core requirements. The Department is grateful for the opportunity to pursue these goals with Laurie.

For additional information on Dr. Heyer, see her home page at USC:
http://www-hto.usc.edu/abha/lheyer.html
Faculty News

Professor and Chair Stephen Davis led the Department to a successful completion of a faculty search, and looks forward to the Department’s external review next year. He and Irl Bivens are working on a new edition of Howard Anton's calculus text for John Wiley and Sons. The 7th edition should be ready in another year. Stephen also keeps busy with the Southeastern Section of the Mathematical Association of America (MAA), where he continues his service as Secretary-Treasurer for the fourth year.

Stephen’s work with high school activities continues unabated. Having completed twelve summers as an Advanced Placement (AP) Calculus grader, most recently as a Table Leader and Question Leader at the Reading in June 1999 in Fort Collins, Colorado, he has been invited back as an Alternate Exam Leader in June 2000. He is also a board member with the N.C. Association of Advanced Placement Mathematics Teachers. He also participates in the Charlotte Math Club, spending a Saturday morning each month with problem solving and other mathematical excitements. The big Club event each year is the trip to the College of Charleston Math Meet, and this year CMC’s group of a dozen or so brought back five team and three individual trophies.

Professor Irl Bivens is working with Stephen on a new edition of Howard Anton’s Calculus text, which should be out next year. Irl was appointed to the national MAA Hasse Prize Committee, which recognizes excellence in expository writing, as well as the editorial board of a new “Problems” book series to be published by the MAA. With Ben Klein, Richie King, and Todd Will, he continues to edit the Problems and Solutions section of the College Mathematics Journal, and he and Ben recently wrote the 2000 N.C. State Mathematics Contest exam. In his spare time, Irl improves his juggling; he and son Robert attended the 1999 International Jugglers Association Summer Festival in Niagara Falls.

Richardson Professor Richie King spent a week in Montana as a follow-up session on environmental modeling. The highlight was a visit to Flathead Lake, which was nothing short of spectacular, with the water clear as a bell and very cold. In a visit to a little research station there maintained by the University of Montana, he noted that the lake has an interesting problem: a freshwater shrimp infestation! Professor King says Lake Norman would trade problems with Flathead Lake any day.

In March 2000, Dolan Professor Ben Klein gave an invited, plenary address, entitled “Reflections on Teaching and Learning,” in Charlotte at the annual meeting of our section of the MAA. He also gave an invited talk on the beta function at the State Conference of the North Carolina Council of Teachers of Mathematics in Greensboro in October 1999.

Ben’s work with the AP program in Calculus continues to occupy a good bit of his time. He served as a Table Leader at the 1999 Reading and will do so again this year. In October 1999, he began service on the AP Test Development Committee, which will entail attending three test development meetings per year for each of the next three years.

Much of the rest of his time is taken up by the responsibilities (shared with Irl, Richie and Todd Will) associated with editing the Problems and Solutions Section of the College Mathematics Journal. We encourage you to submit any good, original problems you have!

Finally, Ben was appointed to head a working group charged with making recommendations for the impending renovation of Chambers Building. Since the last renovation took place almost thirty-five years ago, serving on such a working group is virtually certain to be a once in a (professional) lifetime opportunity for each of its members. If you have any suggestions for the group, send them to Ben.

Associate Professor Donna Molinek was on sabbatical during the 1998-99 school year. She “stayed local,” working on projects that needed completing, starting new ones, and attending conferences. Son Rudy started kindergarten in a multi-age K/1 class, where Donna spent a good deal of time volunteering in the class, including teaching Math Superstars to the first graders in the class. Daughter Sullivan started at Davidson-Cornelius Daycare.

Since returning from sabbatical, she taught Real Analysis (430) and Topology (360), both for
the first time. By all accounts, they were fun and challenging both for the professor as well as the students. The most time-consuming, interesting, and demanding activity of the last year, however, save living with a six-year old and a two-year-old, was the chairmanship of the Stewardship and Finance Committee at Davidson College Presbyterian Church. Donna conducted the Every-Member Canvass this past fall, trying to raise enough money to allow all the other committees to carry out their programs.

The year 2000 started off wonderfully for Donna, except for the news that her tonsils need to come out. Having strep throat five times last year makes one think about such things, and a relapse after coming back to teaching confirmed the need for the surgery, which Donna describes as minor to everyone but her. After that, she’s looking forward to the summer, catching up on reading (both fiction and math), beach trips, and teaching July Experience.

Professor Rich Neidinger is trying out ideas from his article “Sample Calculus” (with Walter Spunde, Mathematics Magazine, June 1999) on Calculus I students using TI-89 calculators. He still loves working on computer projects concerning numerical analysis, chaos, and fractals. This spring, three of his students presented Math Coffees on topics in fractals and chaos, including an honors project. Each Coffee was a multimedia event, showing off our newest classroom equipment. If you’ve been in Rich’s classes, it’s probably hard to imagine that he helps at Davidson Elementary and leads elementary school gathering time at his church. He leads an internet experience to accompany whatever topic is being studied by his daughter’s kindergarten / first grade class.

Kimbrough Associate Professor John Swallow is glad to be back in Davidson after his year in Israel. The family has readjusted both to the busy-ness and expense of being home and have joined St. Alban’s Episcopal Church in Davidson. Daughter Ruth, now nearly four, began preschool at The Children’s Schoolhouse, where Cameron served as a parent volunteer this past year and John will serve as Treasurer this coming year. Daughter Sophie, nearly two, has wrestled with separation anxiety but is now quite social.

After a conference in Rome in the summer, John spent two weeks during the fall semester as a member of the Mathematical Sciences Research Institute (MSRI) in Berkeley. He also attended a weekend conference in Washington, D.C., on research programs for undergraduates. In January he returned to D.C., for the AMS-MAA national meeting, giving a paper and participating in the faculty search. He traveled to N.C. State to give an Algebra Seminar, the University of Richmond to give a Colloquium, and Elon College to give a lecture for inductees to Elon’s Kappa Mu Epsilon honor society of mathematics. In April he was gratified to hear that the Trustees voted to grant him tenure and promotion to associate professor.

Associate Professor Todd Will married his long-time sweetheart Heather Hulett. He published three papers, one co-authored with Heather, which appeared in the SIAM Journal of Discrete Math, the College Math Journal, and the Journal of Pure and Applied Algebra. He taught a short course at the Southeastern Sectional meeting of the MAA, published web pages on “An On-line Introduction to the Singular Value Decomposition,” and spoke on “Families of k-sets with a maximum number of \((k-1)\)-subsets” at the 3rd Annual UNC-Greensboro Conference in Combinatorics and Graph Theory. With Ben and Richie and Irl, he also edited problems for the College Math Journal.

Heather and Todd are currently on the lookout for a house in the Davidson area, and, Heather being a mathematician on leave from Miami University of Ohio, for joint teaching opportunities as well.

Visiting Assistant Professor Rob Whitton continued his highly valued---both by faculty and freshmen---service as a calculus instructor. Rob held down the fort while the rest of the Department spent most of the first week of the spring semester interviewing candidates in D.C. for the faculty position.
Math Coffees

The Mathematics Department and the Bernard Society remained active, hosting several math coffees this year, not to mention a Christmas party at the Neidinger’s house, a spring picnic at the Lake Campus, a screening of “Pi,” and another go-round with math relays.

We heard several talks from mathematicians outside the department, including Clemson’s Alumni Professor (and former MAA Distinguished Teaching Award winner) Joel Brawley discussing gambling in South Carolina in “The Gambler’s Ruin”, and Dr. Jorge Araúz from Claremont McKenna College in California, who treated us to an introduction to the heat equation. In addition, Josh Worsham ’95 along with his colleague Susan Marra from Royal Sun Alliance spoke about life as an actuary. We also heard three candidates for the new position in mathematics, talking variously on applications of mathematics to genomics, the use of wavelets to encode fingerprints, and the number theory behind cryptosystems.

We were delighted to hear about the work of many of our students. Amy Smith ’00 spoke twice, first about her experience at a Research Experiences for Undergraduates site this past summer, and then about her work from her honors thesis on basins of attraction for Newton’s method for cubic polynomials. Randy Skattum ’00 and Sandy Bishop ’00 each shared the projects they completed in Dr. Neidinger’s fractals course, on fractal dimension and the use of fractals to detect cancer, respectively.

We heard tales from students in other courses as well, including the students of Dr. King’s geometry (365) course, Lee Hardee ’00 and Jonah Swann ’01, who discussed their solutions to problems in Mathematics Magazine and the American Mathematical Monthly; the students from Dr. King’s mathematical modeling (210) course, Karen Fritchie ’00, Chesley Garrett ’00, Leila Wormouth ’00, and Lang Robertson ’02, who gave examples of their projects modeling environmental phenomena; and the students from Dr. Davis’ independent study course, Ed Anderson ’00, Rahul Karnik ’00, and Jason King ’02, speaking on the implementation of various programming styles in Scheme. Several senior math majors also provided an information session, “Seniors Speak!”, in which they gave advice on how to choose paths in post-Davidson life.

When necessary, our own faculty leavened the offerings as best we could. Dr. Molinek described mathematical chaos, and Dr. Klein described some interesting problems and solutions he’s run across, following up on his address at the MAA meeting in Charlotte.

Alumni Notes

Late eighties: Gary Branch ’87 enjoys golfing and playing with his two boys. He is Senior Business Analyst with Fundtech Corporation of Norcross, GA.

Christopher N. Jones ’87 is now a partner with BB&T Capital Partners, a $70 million Small Business Investment Company making average investments of $4 million in privately-held companies. Mickey McDonald ’87 just bought a house in Los Angeles with his partner, Tim. Active in research in undergraduate mathematics education, Mickey is Associate Professor of Mathematics and Associate Dean of Students at Occidental College. John W. McNeill ’87 practices dentistry in Raleigh and reports that he recently became President of the 4th District of the N.C. Dental Society. Paul D. Sowell II ’88 married Gillian Casey Sowell (Yale ’88) and lives in Manhattan. Paul is a Vice President with Salomon Smith Barney’s Investment Division, specializing in mergers and acquisitions of financial institutions. After being in Nashville for two years, Jane (Price) Avinger ’89 now works two days a week sharing an Assistant Controller position at Davidson College. Jane spends time with her new daughter Anna.

Early nineties: Jennifer (Stott) Dordevic ’90 keeps busy coaching youth soccer, studying fine wines, watching movies, and doing a
little gardening, and is also employed with Enterprise Social Investment Corporation, which raises equity to build low-income housing. **Tom Tolbert '90** is an Internal Medicine Physician and Assistant Professor of Medicine at the University of Kentucky, and also serves as Staff Physician at the VA Medical Center in Lexington.

**Dan Cotton '91** lives in Newtown, CT, employed as a Biostatistician at Boehringer Ingelheim Pharmaceuticals, now for seven years! He and Kristine welcomed their first child, Thomas, in March 1999. **Mark Pospesel '91** married Marcia de Souza Lima on October 29, 1999, and works a software programmer. **Bob Pullian '91** works as a product manager with Microsoft Corporation in the beautiful Northwest. **William M. Wilson '91** is Law Clerk to The Honorable Henry M. Herlong, Jr., U.S. District Court.

**Barbara (Defenbaugh) Howard '92** writes that she is “simplifying!” She collects foreign math books and is working on translating them. She also works on exhibits for the Children's Museum of Iredell County and enjoys staying home with Madison, her two-year-old daughter. **Jim Leesch '92** is a seventh-grade math and science teacher at the North Shore Country Day School in Winnetka, IL. He also teaches probability and statistics at the Center for Talent Development at Northwestern University, when not board gaming, gourmet cooking, singing with an a cappella group named “Cantate,” and following the Chicago Cubs. **Tammy (Winn) Musgrove '92** finds time to pursue interests in cooking, traveling, home decorating, and craft-making with her husband Kyle, while she works as a Functions Analyst in the Navy Federal Credit Union’s R&D Department and he works as a patent attorney. **Ria Chase '96** is a software engineer at iXL, Inc., and has taken over the wilted plants in her office. “They’ve become my new babies,” she writes. **Matt Griffith '96** is a second-year architecture student at N. C. State University and studies alongside his wife Ashley ’97, a first-year student at Duke’s divinity school. **Allison Sabel '96** is a M.D./Ph.D. student at Tulane University and teaches biostatistics classes at the Tulane School of Public Health. **Heather Wineberg '96** left North Mecklenburg High School to pursue a master’s in statistics at Miami University in Ohio and notes that she likes being close to home. She stays active coaching a girls’ soccer team.

**Late nineties:** **Amy Scalucci '97** is a second-year dental student at the University of Kentucky, volunteering at local high school with a program with Young Life. **James C. Smith '97** works in the branches of First Union as a customer service manager. **Tanner E. Thompson '97** does profit and loss reporting on an oil and gas trading floor with Coastal Corporation. She spent 1998 in Costa Rica doing volunteer work and is now back
in Houston with her family, pursuing her main interest, Spanish.

Amy Biber ’98 teaches secondary mathematics and JV cheerleading at Clover High School while living in Charlotte with Amy Kanoff. Sara Ehinger ’99 guided whitewater rafting trips at the Natahala Outdoor Center and then moved to Seattle to work as a problem solver in the Amazon.com warehouse. Amanda Fleck ’99 enjoys working as an actuarial analyst with Northern Trust Retirement Consulting in Atlanta. She studied about 150 hours for the first actuarial exam. Bryan Kern ’99 works as a derivatives trader and skis, swims, bikes, and reads in his spare time. Jennifer Kazmarek ’99 teaches mathematics at Vance High School in Charlotte and loves it. Uzra Khandker ’99 is a technology analyst at Andersen Consulting and is based in Charlotte. She is currently focussed on e-commerce projects. Amanda Fleck ’99 works in the actuarial department at Hewitt Associates in Atlanta.

**Puzzle Corner**

**NEW:** For a pair of numbers \((a,b)\), define \(f_0(a,b) = (a^2 + b^2, (a+b)^2 - a^2)\) and \(f_1(a,b) = ((a+b)^2 - a^2, (a+b)^2 + b^2)\). So for example \(f_0(1,2) = (5,8)\) and \(f_1(1,0) = (0,1)\).

Given a positive integer \(n\), write \(n+1\) in binary. Then, starting with the pair \((1,0)\), work through the bits of \(n+1\) from left to right, applying \(f_1\) if the bit is a one and \(f_0\) if the bit is a zero.

For example, given \(n = 24\), you write that \(25 = (11001)_2\). Since the first bit of 25 is a one, you apply \(f_1\) to get \(f_1(1,0) = (0,1)\). Since the second bit is a one, you apply \(f_1\) again to get \(f_1(0,1) = (1,2)\). The next bit is a zero so now you compute get \(f_0(1,2)\), and so on.

Prove that the final pair you get consists of the \(n\)th and \((n+1)\)st Fibonacci numbers.

**Note:** The standard definition for the Fibonacci numbers is \(a_1 = a_2 = 1\) and \(a_n = a_{n-1} + a_{n-2}\) for \(n \geq 3\). Using this definition, computing \(a_{1,000,000}\) would require roughly one million additions. However, using the procedure outlined above, the same computation can be accomplished using only 60 multiplications and 60 additions!

**LAST ISSUE’S PUZZLE:**

Let \(S\) be an arc on the quarter of the unit circle in the first quadrant. Let \(A\) be the area under \(S\) and above the \(x\)-axis, let \(B\) be the area to the left of \(S\) and to the right of the \(y\)-axis. Show that \(A + B\) depends only on the length of \(S\) and not on its position.

**Hint:** Name the endpoints of \(S\) \((\cos(\alpha), \sin(\alpha))\) and \((\cos(\beta), \sin(\beta))\).

The *Bernard Society Review* welcomes news from all mathematically inclined Davidson alumni, whether they took courses in mathematics at Davidson or developed an interest in mathematics following graduation. Please keep in touch and send your news to Frances Alexander, Departmental Assistant for Anthropology, Mathematics, Philosophy, and Sociology, P. O. Box 1719, Davidson, NC 28036-1719; fralexander@davidson.edu.